## Rec'd PCT/PTO 1 5 JUN 2005

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

## (19) World Intellectual Property Organization

International Bureau



## ) (BRACE SUITEREN) A BUSTAR EIREN BERKA BERKA BERKE I IN 111 BETTET BUITE BUITE BUITE BERKE BUIT BERKAUN 1848 HAD 1840

(43) International Publication Date 8 July 2004 (08.07.2004)

**PCT** 

(10) International Publication Number WO 2004/056946 A2

(51) International Patent Classification7:

\_\_\_\_\_

C10G 67/04

(21) International Application Number:

PCT/EP2003/014544

(22) International Filing Date:

12 December 2003 (12.12.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: MI2002A 002713

20 December 2002 (20.12.2002) IT

MI2003A 000693

8 April 2003 (08.04.2003) I'

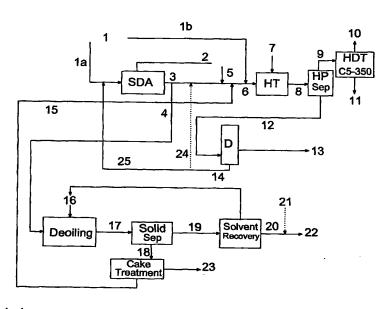
(71) Applicants (for all designated States except US): ENI S.p.A. [IT/IT]; Piazzale E. Mattei, 1, I-00144 Rome (IT). SNAMPROGETTI S.p.A. [IT/IT]; Viale de Gasperi, 16, I-20097 San Donato Milanese (IT). ENITECNOLOGIE S.p.A. [IT/IT]; Via F. Maritano 26, I-20097 San Donato Milanese (IT).

(72) Inventors; and

- (75) Inventors/Applicants (for US only): MONTANARI, Romolo [IT/IT]; Via Martiri di Cefalonia 53/B, I-20097 San Donato Milanese (IT). MARCHIONNA, Mario [IT/IT]; Viale Abruzzi 44, I-20131 Milan (IT). PANARITI, Nicoletta [IT/IT]; Via Petrarca, 35, I-23900 Lecco (IT). DELBIANCO, Alberto [IT/IT]; Via Castellazzo, 6, I-20013 Magenta (IT). ROSI, Sergio [IT/IT]; Via G. Dossetti 5B, I-20097 San Donato Milanese (IT).
- (74) Agents: DE GREGORI, Antonella et al.; ING. Barzano' & Zanardo Milano. S.p.A., Via Borgonuovo 10, I-20121 Milan (IT).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

[Continued on next page]

(54) Title: PROCESS FOR THE CONVERSION OF HEAVY FEEDSTOCKS SUCH AS HEAVY CRUDE OILS AND DISTILLATION RESIDUES



(57) Abstract: Process for the conversion of heavy feedstocks selected from heavy crude oils, distillation residues, heavy oils coming from catalytic treatment, thermal tars, oil sand bitumens, various kinds of coals and other high-boiling feedstocks of a hydrocarbon origin known as black oils, by the combined use of the following three process units: hydroconversion with catalysts in slurry phase (HT), distillation or flash (D), deasphalting (SDA), comprising the following steps: • mixing at least part of the heavy feedstock and/or at least most of the stream containing asphaltenes obtained in the deasphalting unit with a suitable hydrogenation catalyst and sending the mixture obtained to a hydrotreatment reactor (HT) into which hydrogen or a mixture of hydrogen and H2S is charged; • sending the stream containing the hydrotreatment reaction product and the catalyst in dispersed phase to one or more distillation or flash steps (D) whereby the different fractions coming from

the hydrotreatment reaction are separated; • recycling at least part of the distillation residue (tar) or liquid leaving the flash unit, containing the catalyst in dispersed phase, rich in metal sulfides produced by demetallation of the feedstock and possibly coke, to the deasphalting zone (SDA) in the presence of solvents, optionally also fed with at least a fraction of the heavy feedstock, obtaining two streams, one consisting of deasphalted oil (DAO) and the other containing asphaltenes, characterized in that a fraction of the stream containing as phaltenes, coming from the deasphalting section (SDA), called flushing stream, is sent to a treatment section with a suitable solvent for the separation of the product into a solid fraction and a liquid fraction from which said solvent can be subsequently removed.